Miller + Morton 1952

the caudal region is approached. (3) The shape of the supra-occipital crest is distinctive. Especially noticeable is the fact that, in lateral outline, this crest slopes downward from its most anterior point, giving a marked concave appearance to the top of the head. (4) The supra-occipital crest also projects strongly forward, in lateral outline, from that portion of the head directly in front of the eye.

The best illustration of the only other obvious species in the genus (*Lophotes fiski* Günther is considered to be generically distinct) is given in Temminck and Schlegel (*in* Siebold, 1842–50, Fauna Japonica: 132, pl. 71). This form, *Lophotus capellei* Temminck and Schlegel, is also figured in Boulenger (1900, Mar. Invest. S. Africa, 1: 13, pl. 4). The photograph presented by Goin and Erdman (*loc. cit.*) is almost certainly of this species. These illustrations, together with such descriptions as are available, show that *L. capellei* possesses several obvious characters which separate it from *L. lacepedei* Giorna, as shown by the following (see also Fig. 1): (1) The first dorsal spine is comparatively short and weak, somewhat less than the length of the head. (2) This first dorsal spine is followed by progressively smaller spines or rays until a low point is reached above the anterior edge of the eye. Posteriorly from this point the rays, together with the fin membrane, gradually increase in height. As a result the dorsal is almost completely separated into two parts, a short section on the front of the supra-occipital crest and the main portion extending back to the caudal region. In this species, even if the first dorsal spine becomes broken off, this front section of the fin should still be distinct as a small tuft of elongate spines or rays (exactly as it appears in the photograph of the Florida specimen in Goin and Erdman). (3) In lateral outline, the top of the supra- occipital crest extends posteriorly in virtually a straight line, merging with the dorsal outline of the rest of the body of the fish. (4) This supra-occipital crest projects only slightly forward, in lateral outline, from that portion of the head in front of the eye.

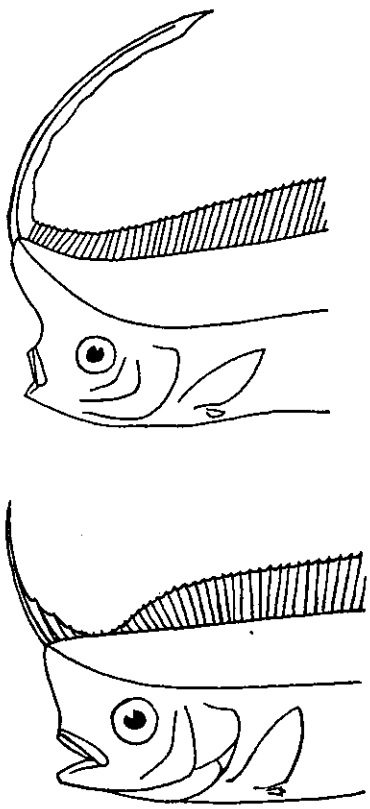

Fig. 1. Outline drawings of the head region of *Lophotus lacepedei* (above) and *L. capellei* (below).

In consideration of this information, it is concluded that the genus *Lophotus* is separable into at least two distinct species and that, for the present, the 1951 Florida specimen (U. S. National Museum No. 151118) must be identified with *L. capellei* rather than with *L. lacepedei*.—JOHN C. BRIGGS, *Natural History Museum, Stanford University, California.*

TRI-SODIUM PHOSPHATE AS A STORAGE MEDIUM FOR OTOLITHS.—Clemens (1951, Trans. Amer. Fish. Soc., 80 (1950): 163–173) has shown the merit of tri-sodium phosphate as a storage medium for otoliths. We concur, having used it for otoliths of the burbot (*Lota lota lacustris*) and the arctic char (*Salvelinus alpinus*). However, we have found that inks often used by ichthyologists for labelling (Higgins Engrossing Ink and Higgins Eternal Black Ink) are not permanent in tri-sodium phosphate. After three to four months much carbon has fallen from the labels and they can be read only with difficulty. Presumably other carbon inks would be similarly affected. Persons using this chemical should label with pencil.—C. RICHARD ROBINS AND RICHARD H. BACKUS, *Department of Conservation, Cornell University, Ithaca, New York.*

FIRST RECORD OF THE DOLLY VARDEN, *SALVELINUS MALMA*, FROM NEVADA.—According to Gilbert and Evermann (1894, Bull. U. S. Fish Comm., 14: 201) and Schultz and DeLacy (1935, Jour. Pan–Pacific Res. Inst., 10 (4): 374), this species is common in the upper Columbia River drainage, but uncommon in the Snake River drainage. In a letter to the junior author dated October 16, 1951, James C. Simpson, Fish Culturist of the State of Idaho Department of Fish and Game, wrote: "To the best of my knowledge, at the present time there are no Dolly Varden in the Wood

or Weiser Rivers. However, there are some still taken from the Payette River system. In all of my fish collecting work I have not taken a Dolly Varden trout above Shoshone Falls." So far, however, this species does not appear to have been recorded from the Snake River system except in Little Lost River, Idaho (which enters the Snake above Shoshone Falls), where Hubbs and Miller (1948, Bull. Univ. Utah, 38 (20): 76) regarded it as a probable glacial relict. It once may have occurred in the adjacent Bonneville system of Utah and Idaho (Rostlund, 1951, COPEIA (4): 296), to which the upper Snake fish fauna is closely allied. *Salvelinus malma* (Walbaum) has never been reliably reported from the state of Nevada. The recent listing of this species from northeastern Nevada by La Rivers and Trelease (1952, Calif. Fish and Game, 38: 115) was based on testimony only, but subsequently three specimens were collected and are recorded below.

On August 27, 1934, while making a survey of the waters of Humboldt National Forest for the U. S. Bureau of Fisheries, S. D. Durrant collected two Dolly Varden in Dave Creek, 4 miles above its junction with the East Fork of Jarbidge River, T47N, R9E, Sec. 25, Elko County, Nevada (see map of Humboldt National Forest, U. S. Forest Service, 1942 ed.). This locality lies about 4½ miles south of the Nevada–Idaho line and approximately 4½ miles northeast of Jarbidge. Jarbidge River is a tributary of the Bruneau River which enters the Snake River about 100 miles below the impassable Shoshone Falls. The larger specimen (deposited at the University of Michigan) is a mature male with swollen testes and is about 169 mm. in standard length, and the smaller one (at the University of Utah) is an immature fish 105 mm. long.

Morphological measurements and meristic counts, made on these two specimens by the junior author, fall within the known range of variation for the species. The only other species of *Salvelinus* that might reasonably be expected to occur in this area is *S. fontinalis* (Mitchill), which has been introduced with varying success in many western streams. The absence of dark spots on the dorsal or caudal fins and the relatively high vertebral counts (67 and 64, including the hypural) provide the best evidence that these specimens are *malma* rather than *fontinalis*. Subspecific allocation is reserved, pending a revision of *Salvelinus* by one of us (Morton).

Three additional specimens of *S. malma*, all males, are in the collection of the Department of Biology, University of Nevada. They were identified by Ira La Rivers and T. J. Trelease and were collected by Earl Dudley, a warden of the Nevada Fish and Game Commission, on July 5, 1951, on the East Fork of the Jarbidge River. Their standard lengths, in mm., are 168, 190, and 193.

This species still occurs in at least one Snake River tributary, but it is evidently uncommon in northern Nevada for a recent survey of most of the streams of that area failed to reveal any specimens (Miller and Miller, 1948, COPEIA (3): 174–87). Whether it may have been planted in this region (Trelease and La Rivers, *loc. cit.*) is open to question as the Nevada hatchery superintendent who claims to have handled the Dolly Varden kept no records and may have been mistaken (La Rivers, *in litt.*, March 17, 1952).

We are greatly indebted to Professor Durrant, of the University of Utah, who called the attention of the senior author to the 1934 specimens, and also wish to thank Professor A. M. Woodbury, Head of the Department of Vertebrate Zoology, University of Utah, for permission to study and report on the material and for the gift of one of the specimens. Our thanks are also due Ira La Rivers and T. J. Trelease who supplied the data on the three specimens at the University of Nevada.—ROBERT RUSH MILLER, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan,* AND WM. MARKHAM MORTON, *U. S. Fish and Wildlife Service, Swan Island, Portland, Oregon.*

OBSERVATIONS OF AGE AND GROWTH IN THE MENHADEN (*BREVOORTIA TYRANNUS*) AS DETERMINED BY SCALE EXAMINATION.—This study is based on examination of scales from 34 menhaden, *Brevoortia tyrannus* (Latrobe), taken in November and December, 1949, and January, 1950, by Mr. John Robas, a commercial fisherman operating out of Beaufort, North Carolina. Measurement was made from the tip of the lower jaw to the fork of the tail, and is the median or fork length as defined by Ricker and Merriman (1945, COPEIA (4): 184–91). The sample is small and the application of results is limited accordingly.

Gratitude is expressed to Mr. Clinton E. Atkinson for helpful comments and suggestions, to Mr. James E. Sykes for assistance in preparing the accompanying graph, and to Mr. Charlie L. Perkins for assistance with parallel scale readings.

Four scales taken from below the dorsal fin were soaked in water, cleaned by rubbing between the fingers, and mounted in glycerin jelly for examination. The criteria for determining true annuli as established for the Pacific pilchard by Walford and Mosher (1943, U. S. Fish and Wildlife Serv., Spec. Sci. Rept., 3 (12): 4 pp.) were followed in this examination. Thus, a mark herein referred to as an annulus is one which was observed to be concentric with the margin of the scale, traceable entirely around the sculptured portion, and found in all normal scales from an individual. As here used, "annulus" refers